The U. S. Navy's Efforts to Track Atlantic Sturgeon Movements in the Chesapeake Bay

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Navy Receiver Array in the Lower Chesapeake Bay

Photo credit: Chris Hager

Navy Receiver Array in the Lower Chesapeake Bay

Photo credit: Chris Hager

Photo credit: Matt Balazik

Navy Receiver Array in the Lower Chesapeake Bay

Atlantic sturgeon can grow up to 14 feet and weigh in excess of 800 pounds

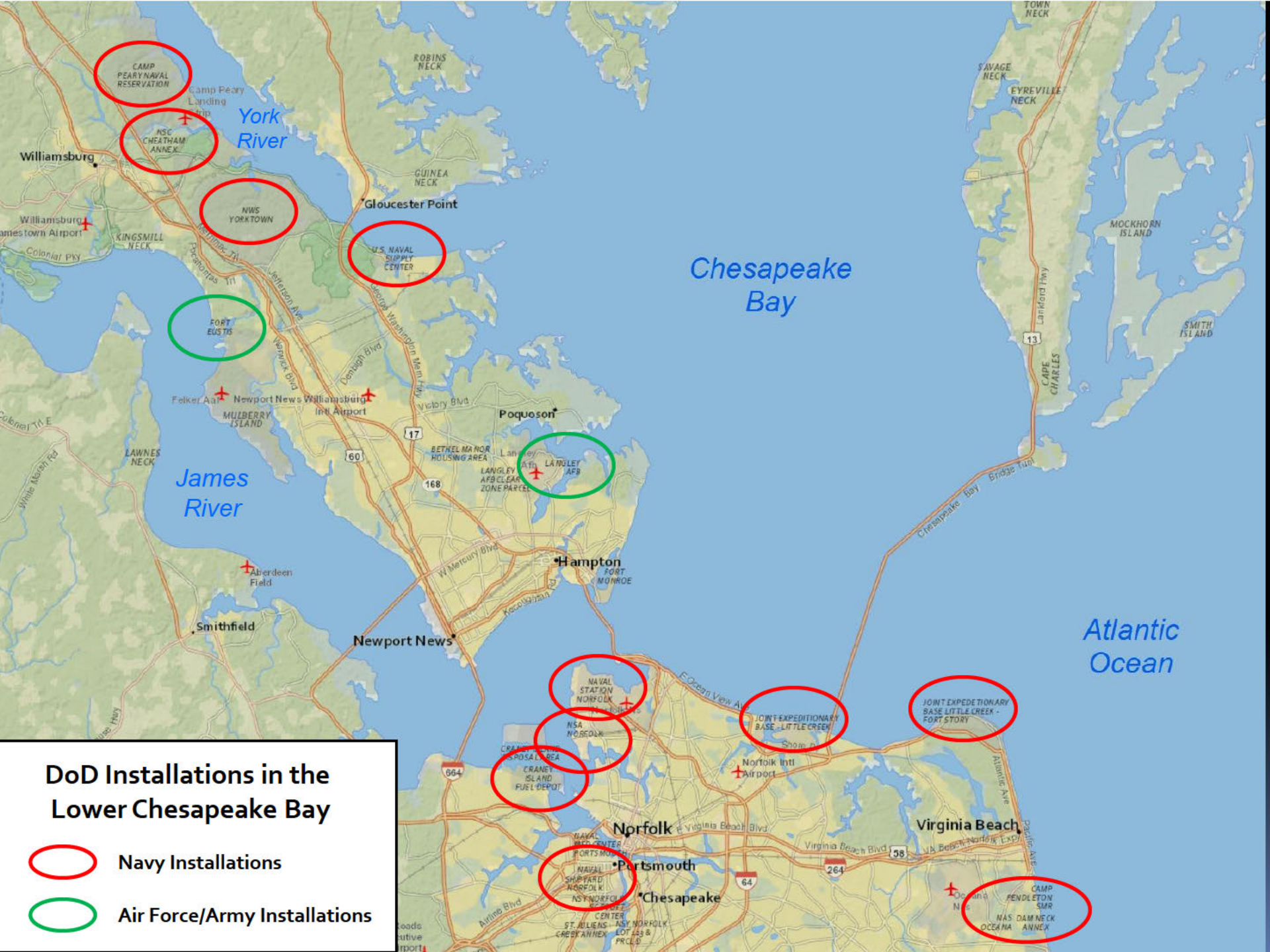
Why is the Navy Concerned About Atlantic Sturgeon?

- Atlantic sturgeon were listed under the ESA on 31 January 2012.
- As part of this listing, the Chesapeake Bay distinct population segment was listed as endangered
- It is the Navy's responsibility to minimize impacts to the species to the extent practicable and aid in its recovery where possible

Navy Receiver Array in the Lower Chesapeake Bay

Why is the Navy Concerned About Atlantic Sturgeon Specifically in the Chesapeake Bay?

- The Navy, and the Department of Defense in general, has numerous installations throughout the lower Chesapeake Bay and its tributaries.
- The Navy regularly conducts training, testing, and routine maintenance activities in the Chesapeake Bay and its tributaries which may potentially impact Atlantic sturgeon in the vicinity of the activity.



DoD Installations in the Lower Chesapeake Bay

- Navy Installations
- Air Force/Army Installations

Identified Data Gaps for the Chesapeake Bay

- When are sturgeon present within the Bay?
- What areas of the Bay are they utilizing?
- How long are they staying at any given location?
- What are their seasonal movement patterns?
- What are the areas and periods of overlap between the Navy's and the sturgeon's use of the Bay?

Vemco® VR2W Receiver

NAVFAC
Naval Facilities Engineering Command

Navy Acoustic Receiver Array

January 2014

Vemco VR2W Receivers

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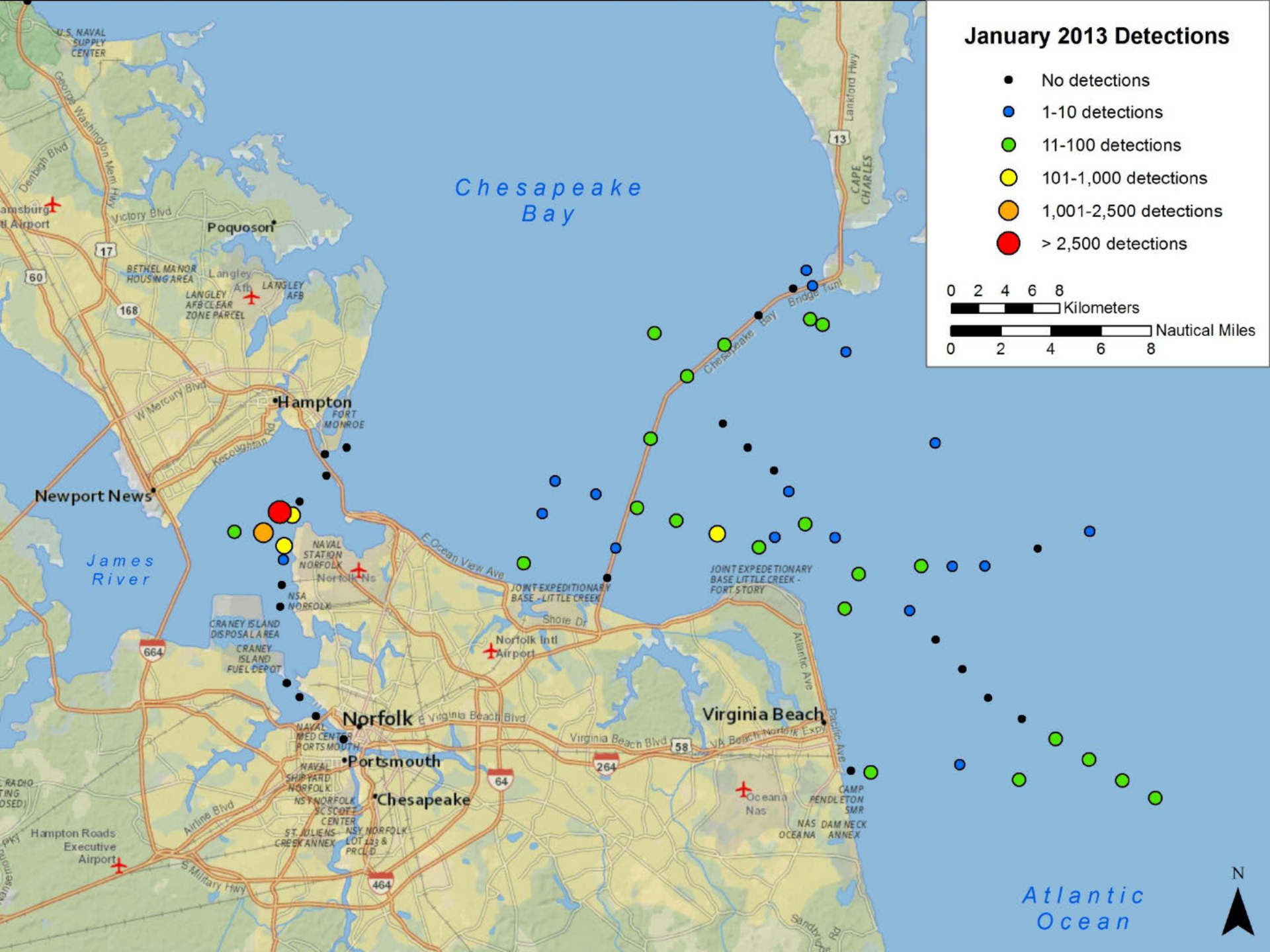
0 4 8 12 16 Miles

Coordination Efforts to Establish Array

- The Navy coordinated with the U.S. Coast Guard, the Chesapeake Bay Bridge Authority, the Pamunkey Indian Tribe, and private landowners to place acoustic receivers.
- Acoustic receivers were attached to navigation buoys, pilings on bridges, and from private piers or docks.

VEMCO® VR2W Acoustic Receiver

Monthly Changes in Atlantic Sturgeon Detections within the Lower Chesapeake Bay During 2013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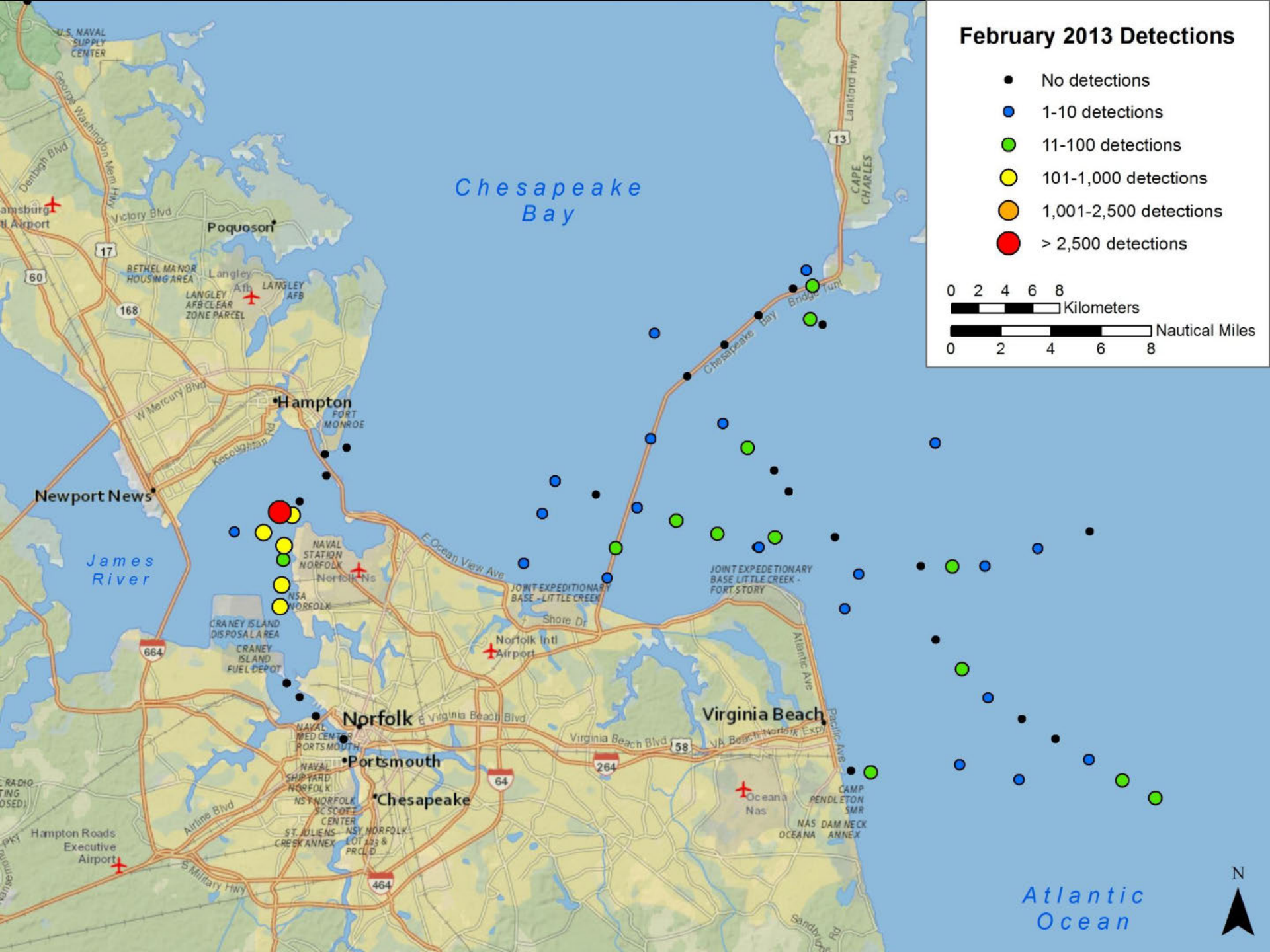
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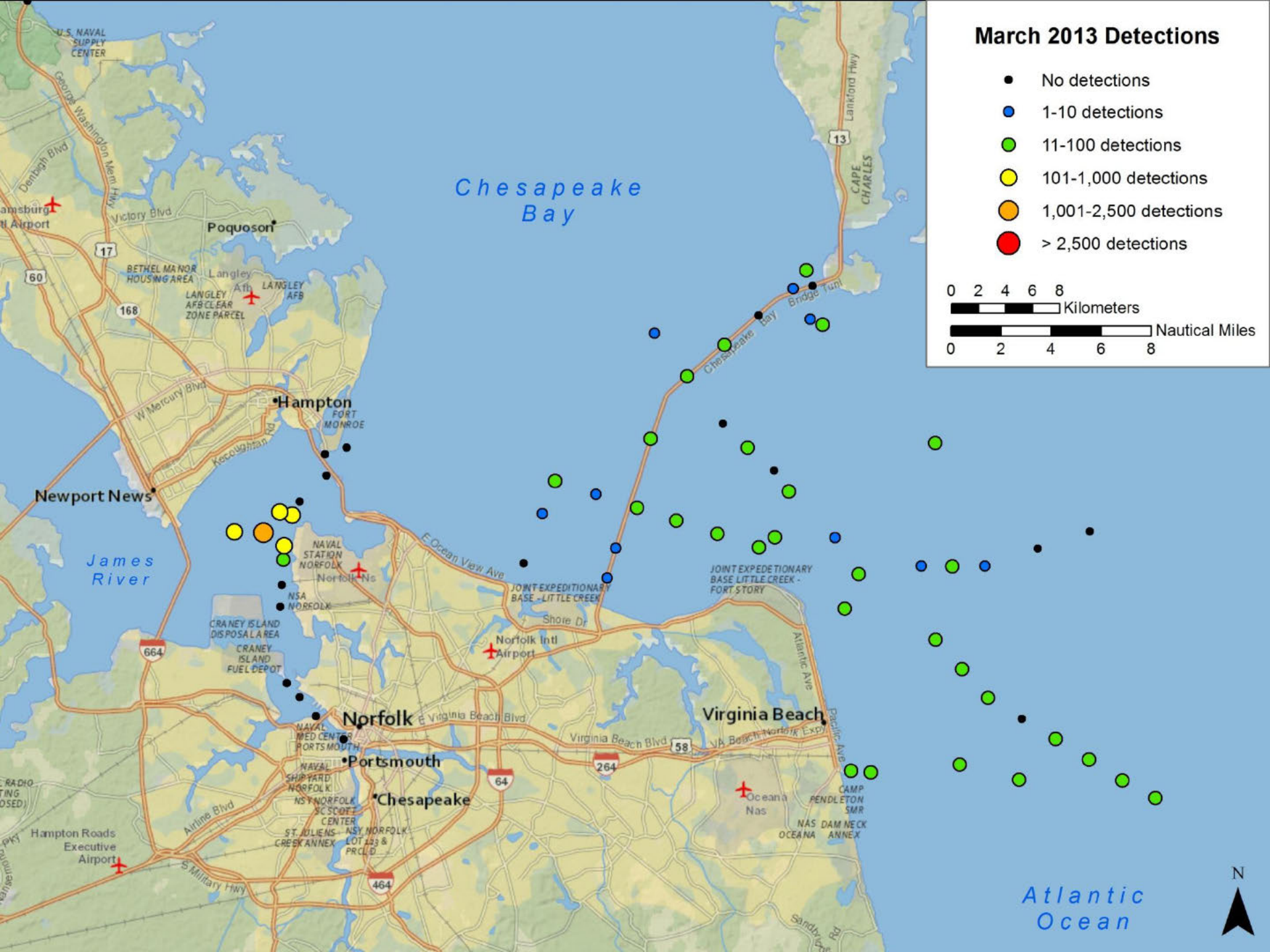
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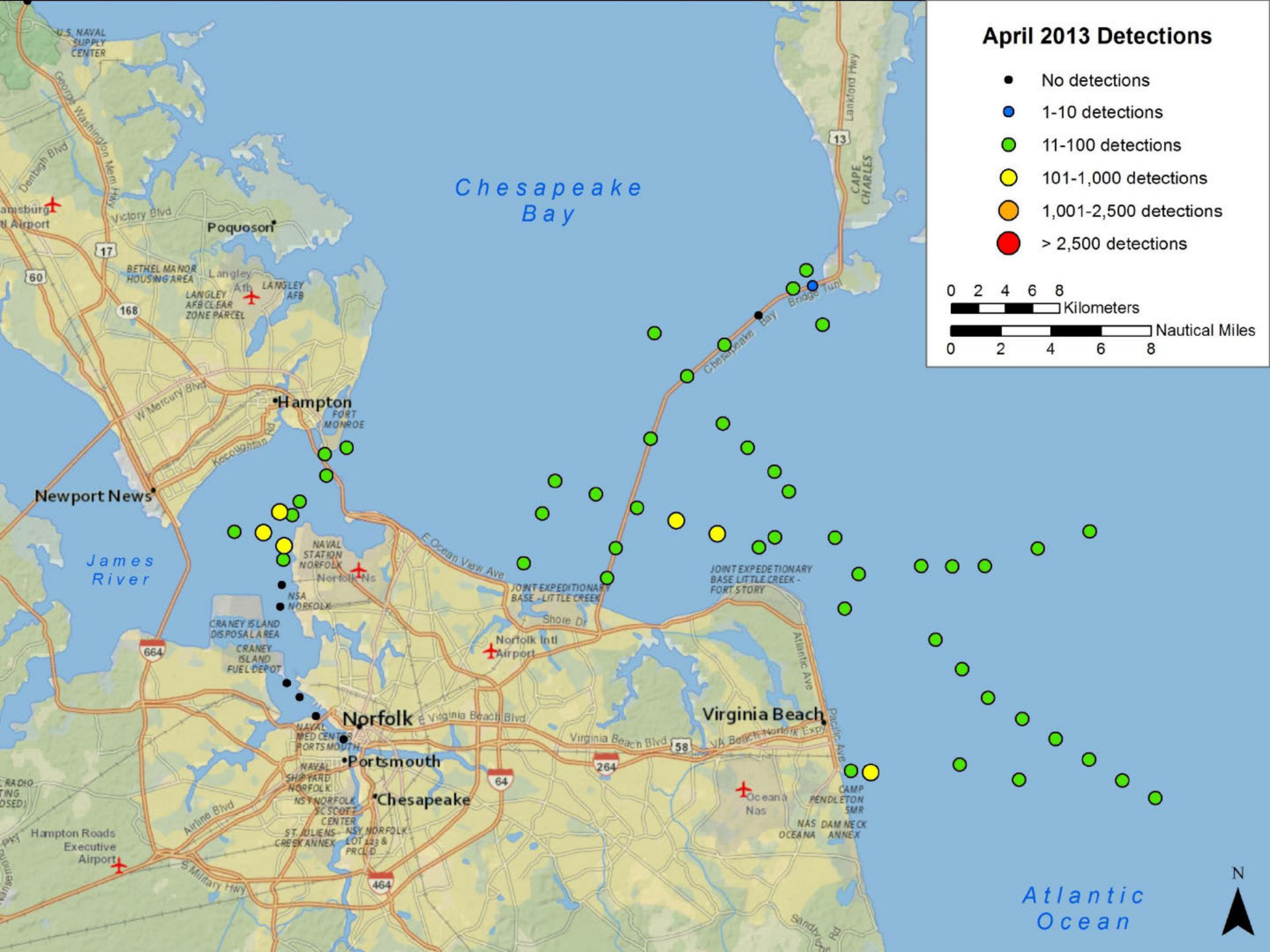
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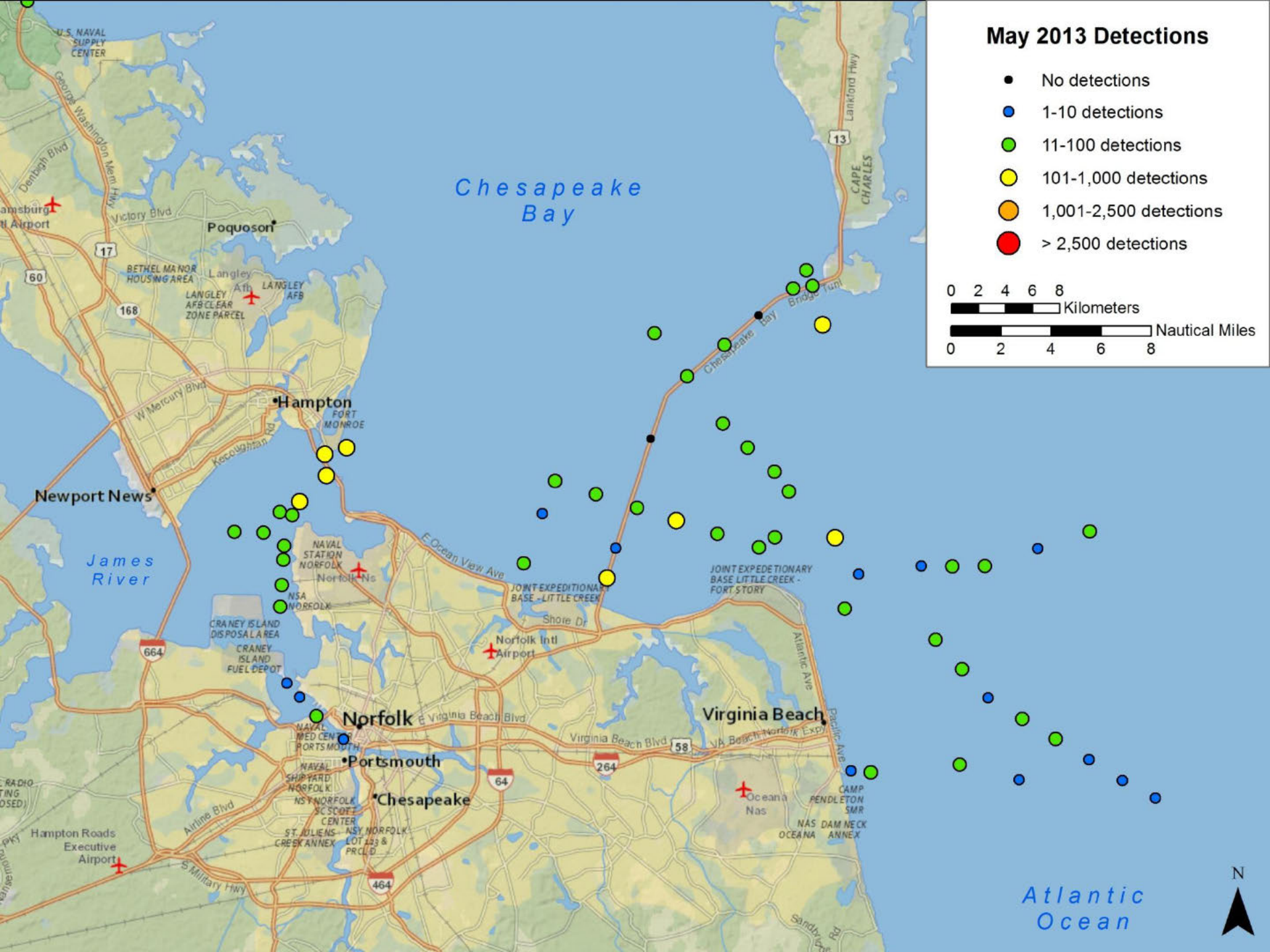
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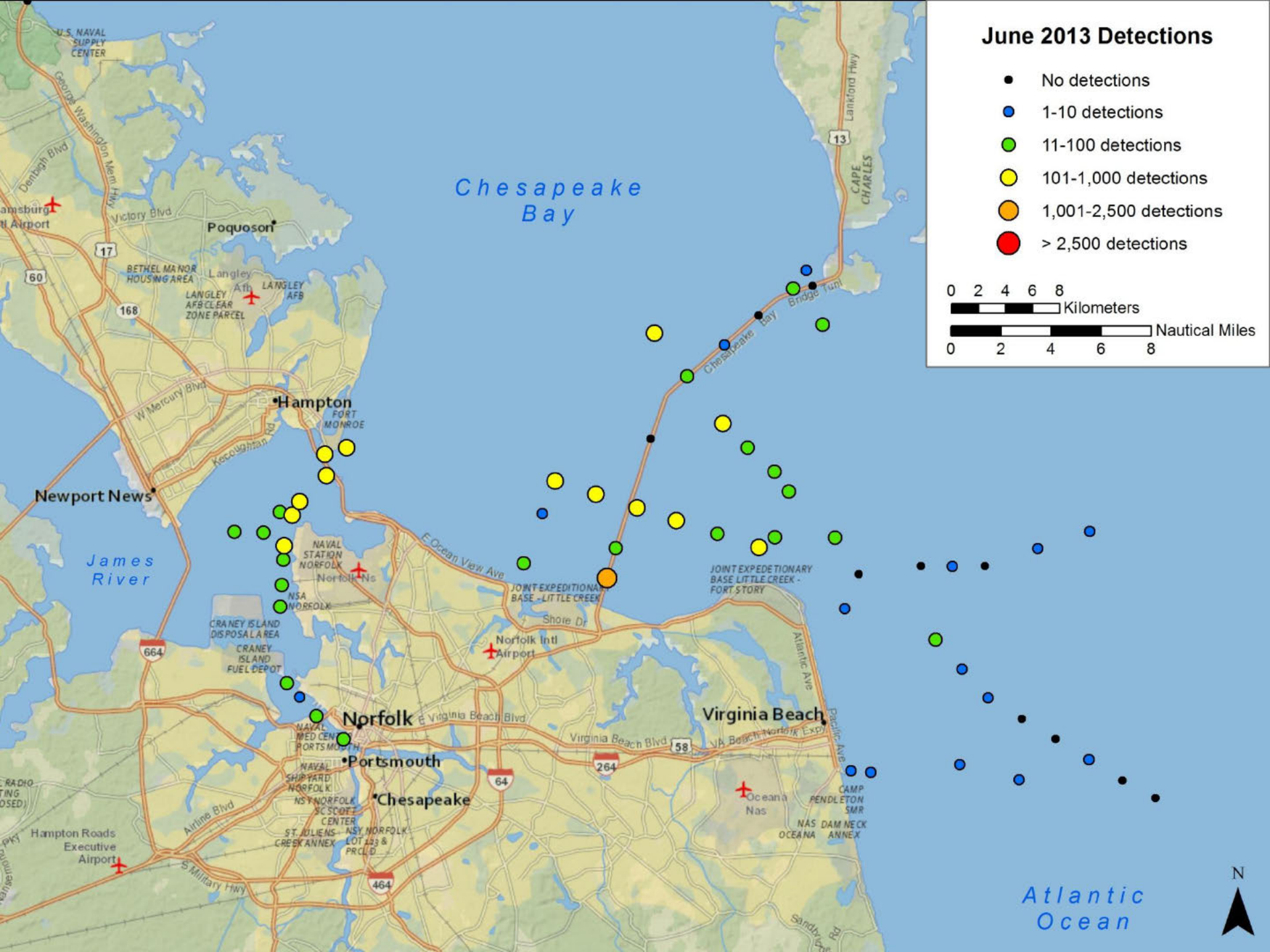
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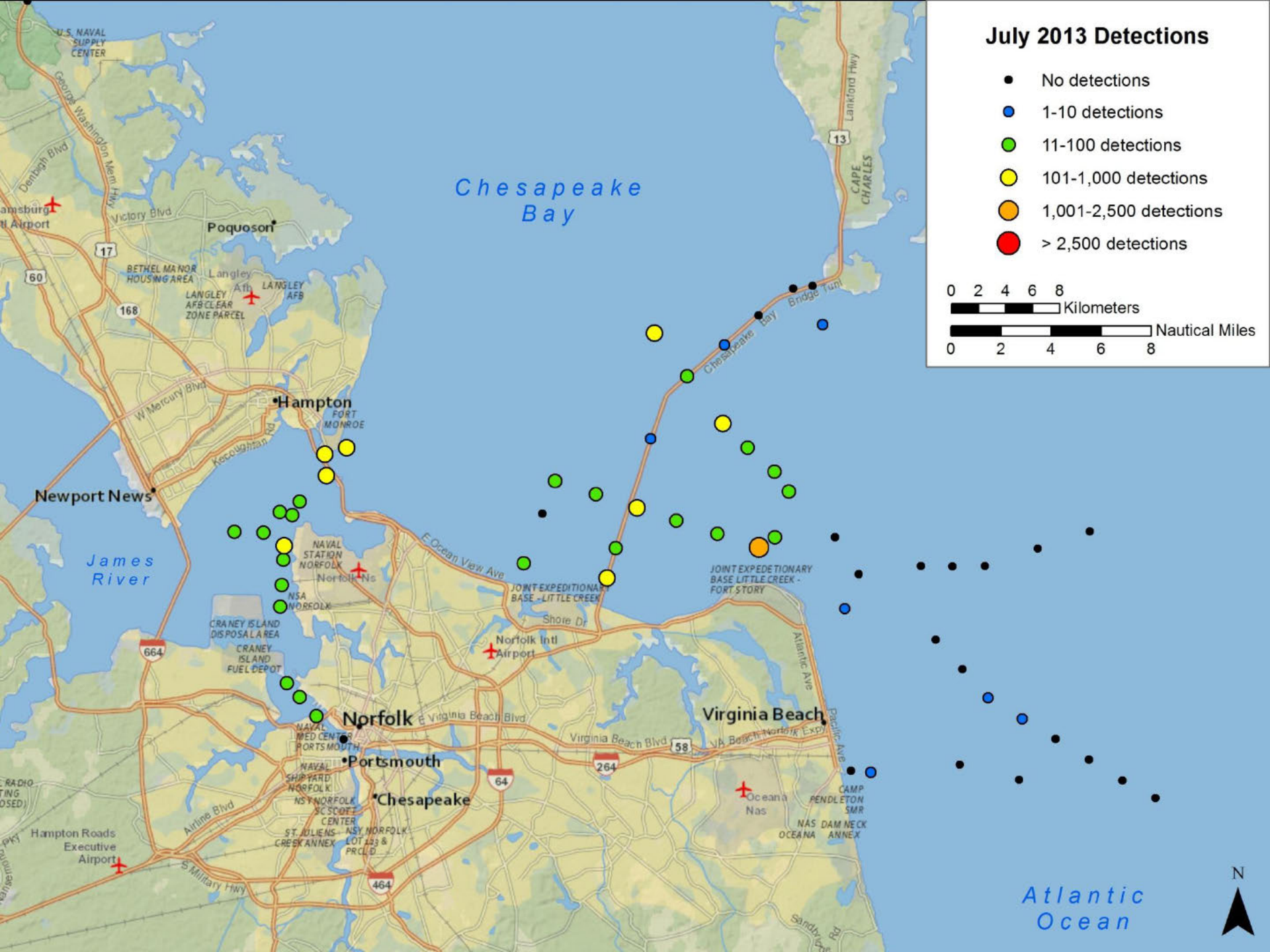
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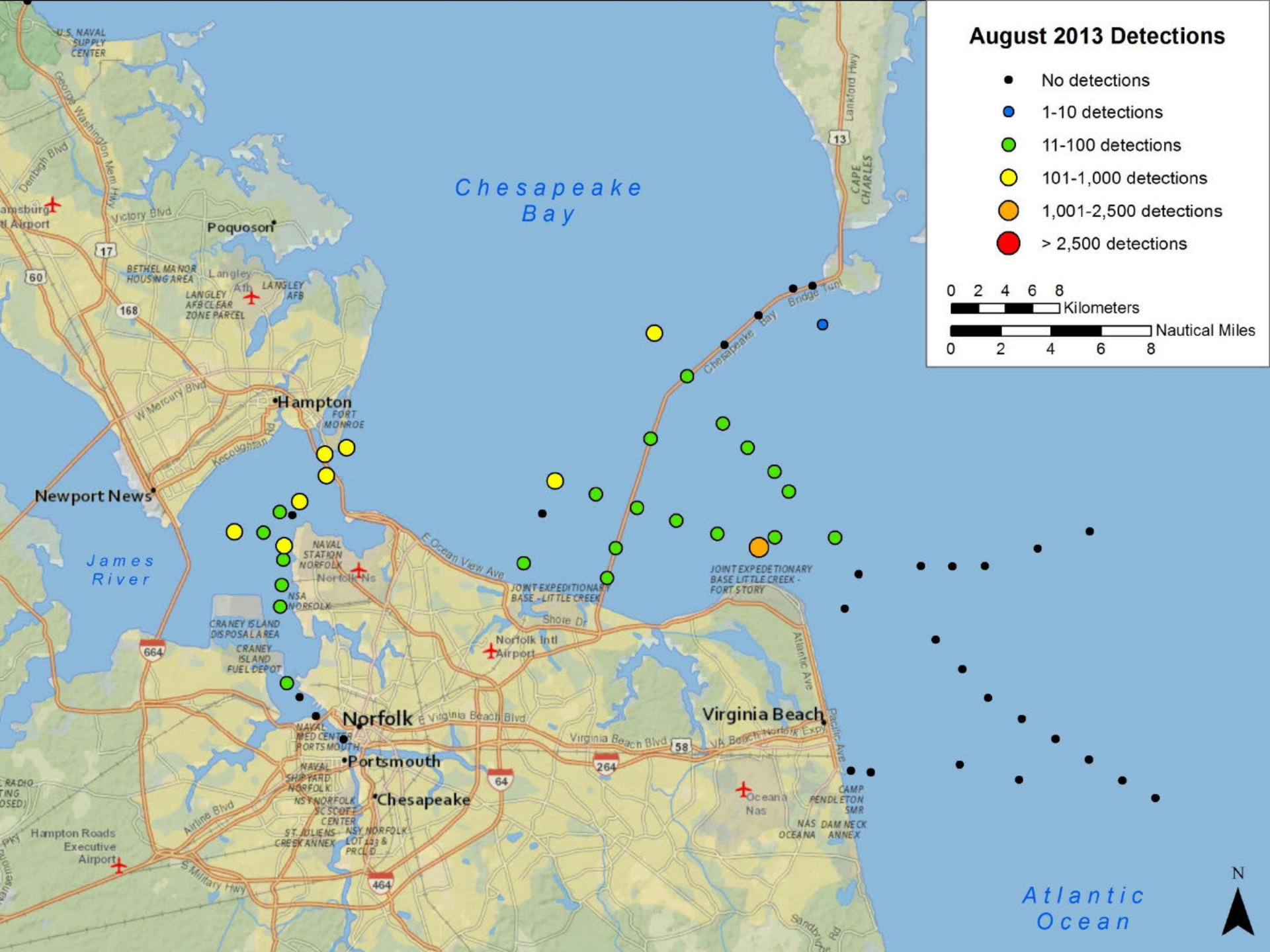
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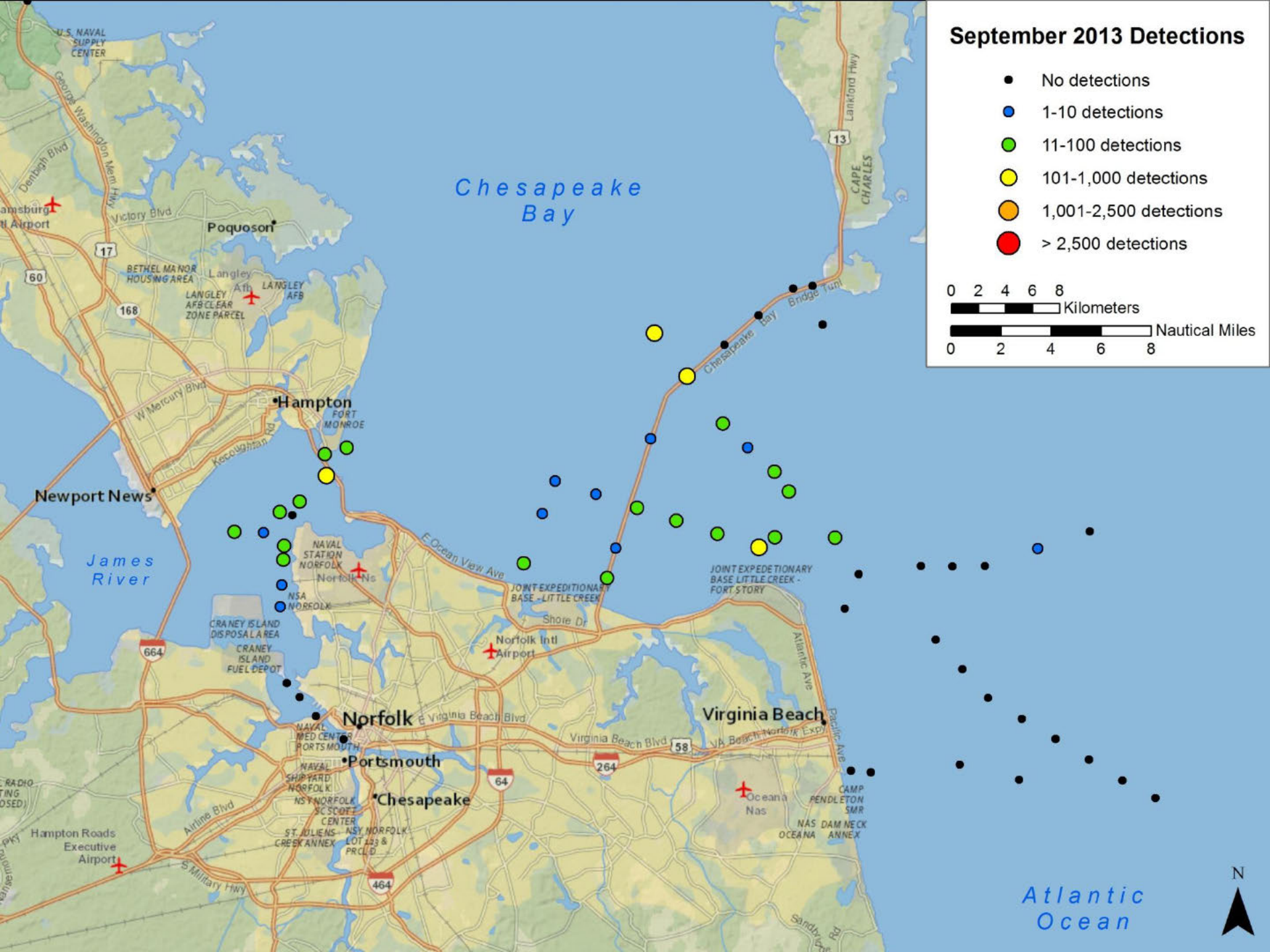
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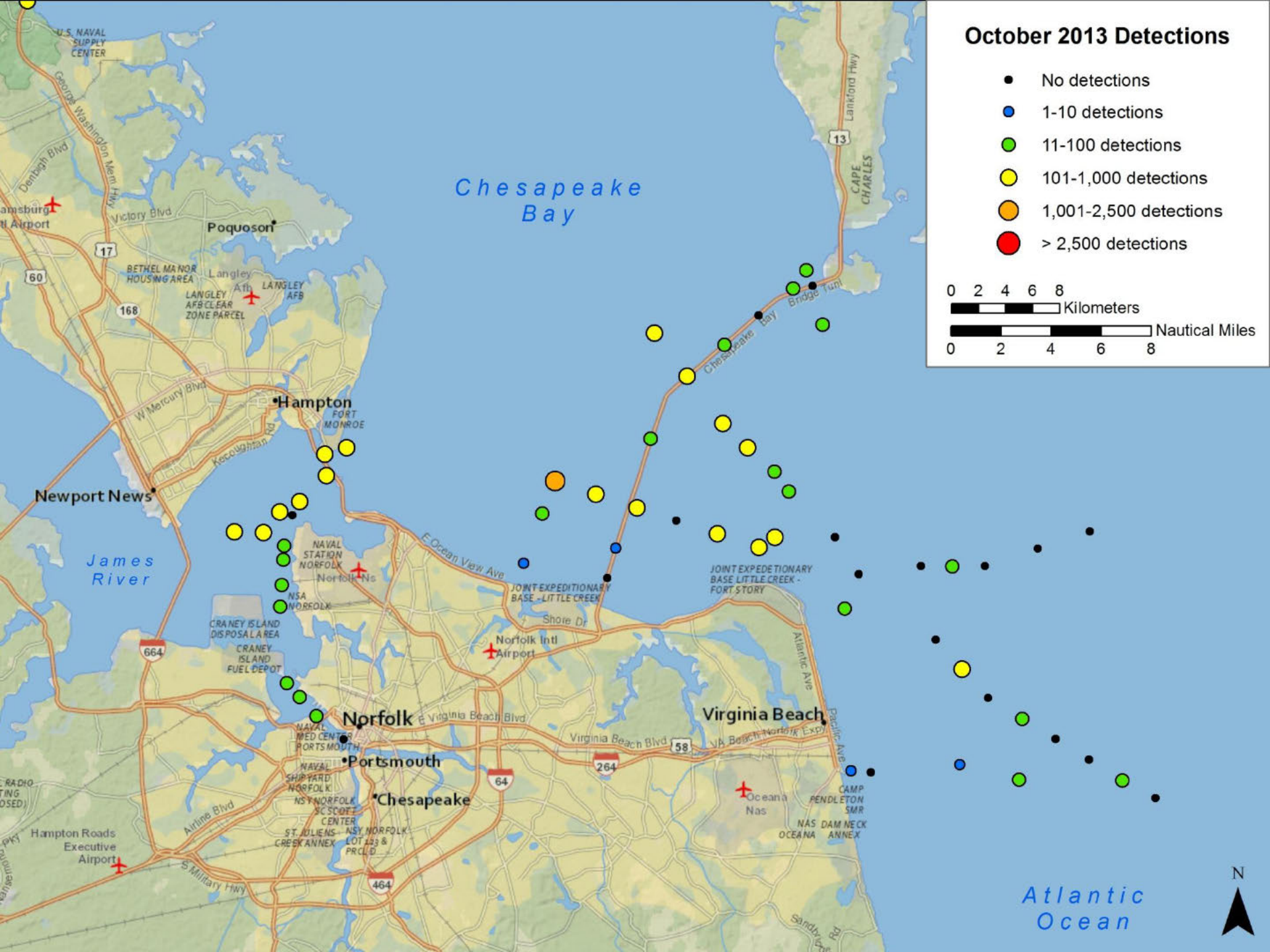
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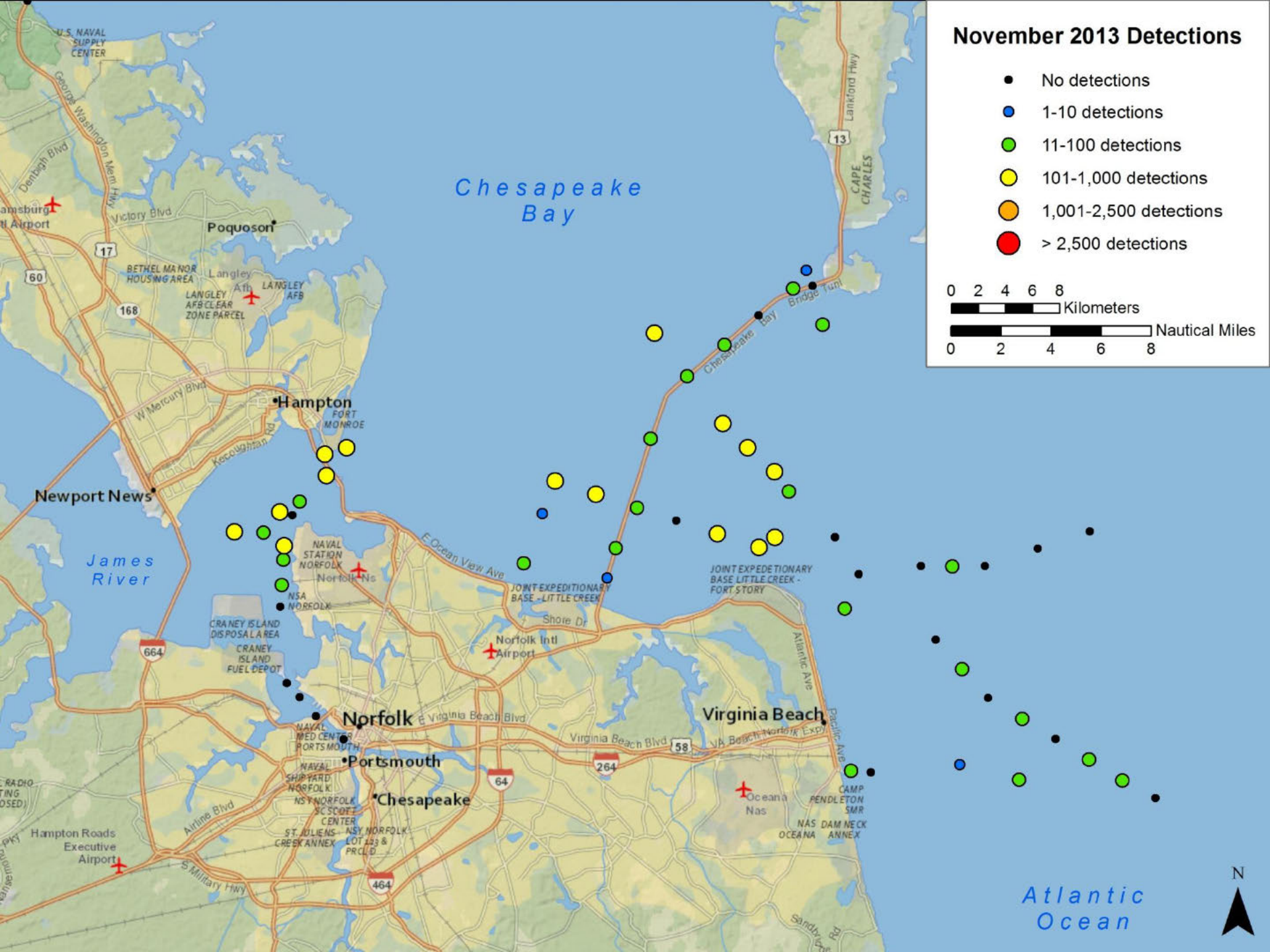
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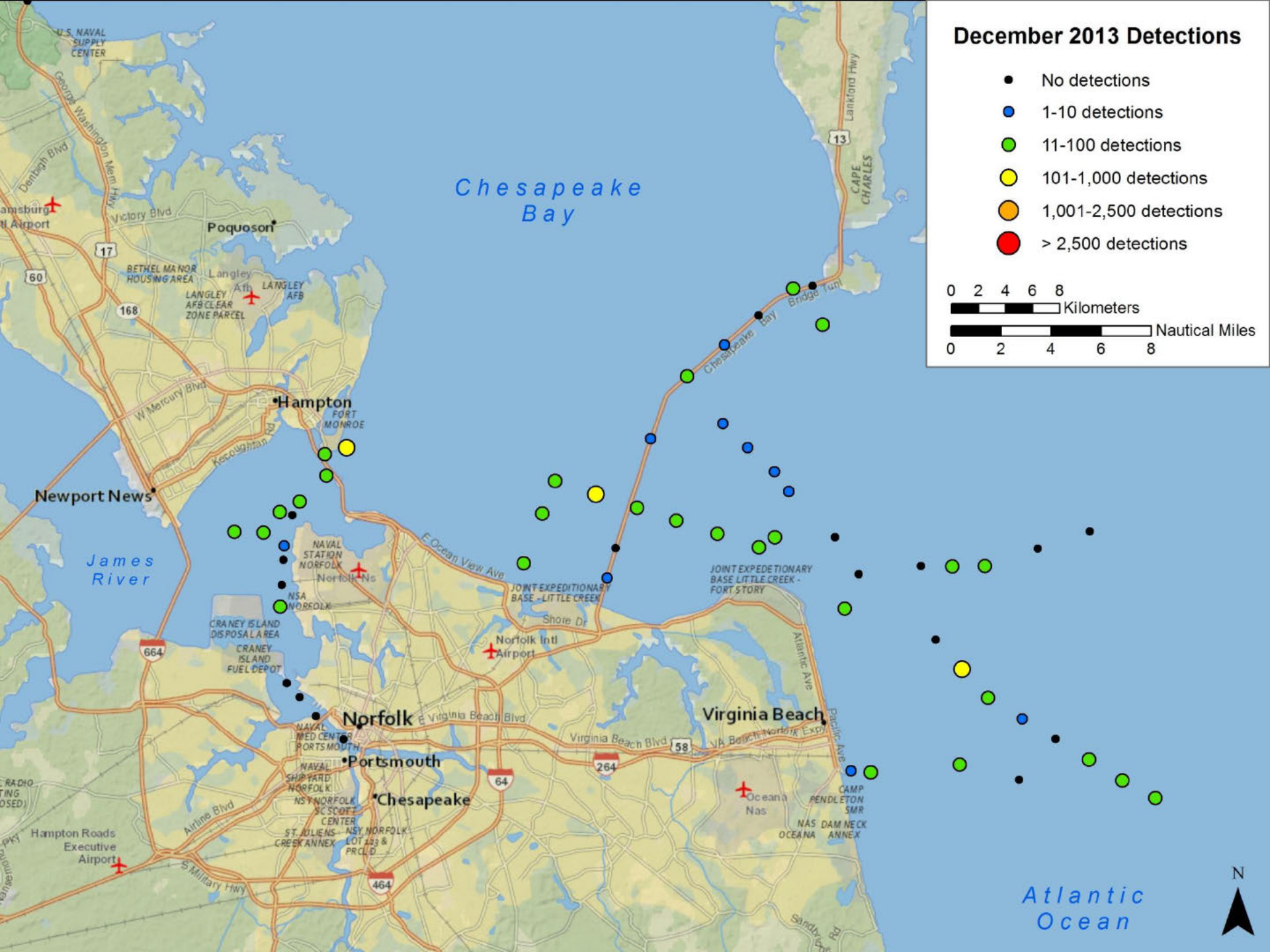
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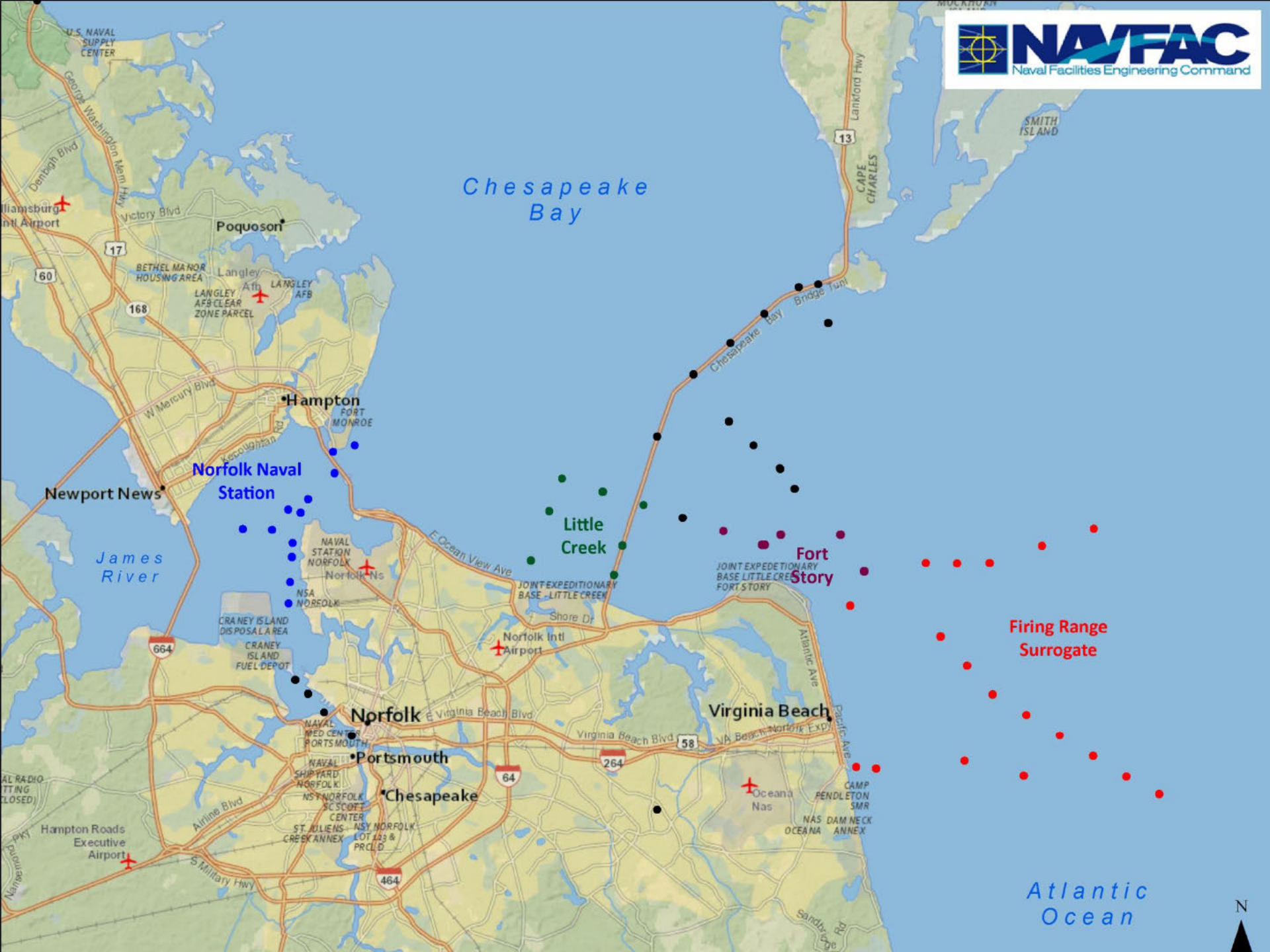
Understanding Habitat Utilization by Sturgeon

- Looking at detection data alone does not provide the full picture.
- Must also look at additional information provided by the array including the number of individual fish detected and the days during each month that sturgeon were present in an area.
- Combining these factors for a given location helps determine the utilization of that location by Atlantic sturgeon over time.


NAVFAC
Naval Facilities Engineering Command
Chesapeake Bay
James River
Atlantic Ocean
Norfolk Naval Station
Little Creek
Fort Story
Firing Range Surrogate
Newport News
Hampton
Poquoson
Norfolk
Portsmouth
Chesapeake
Virginia Beach
Norfolk Intl Airport
Hampton Roads Executive Airport
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Langley AFB
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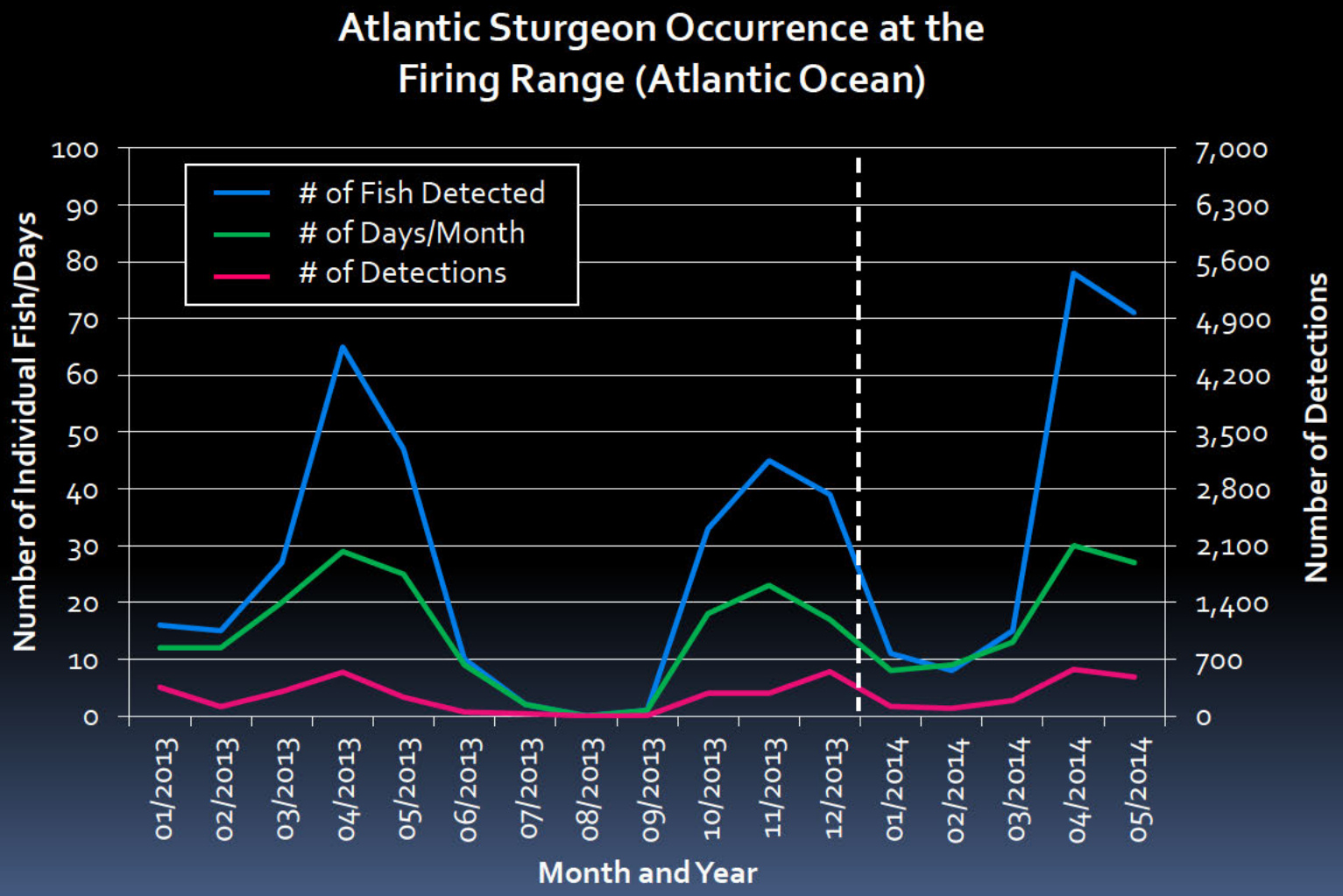
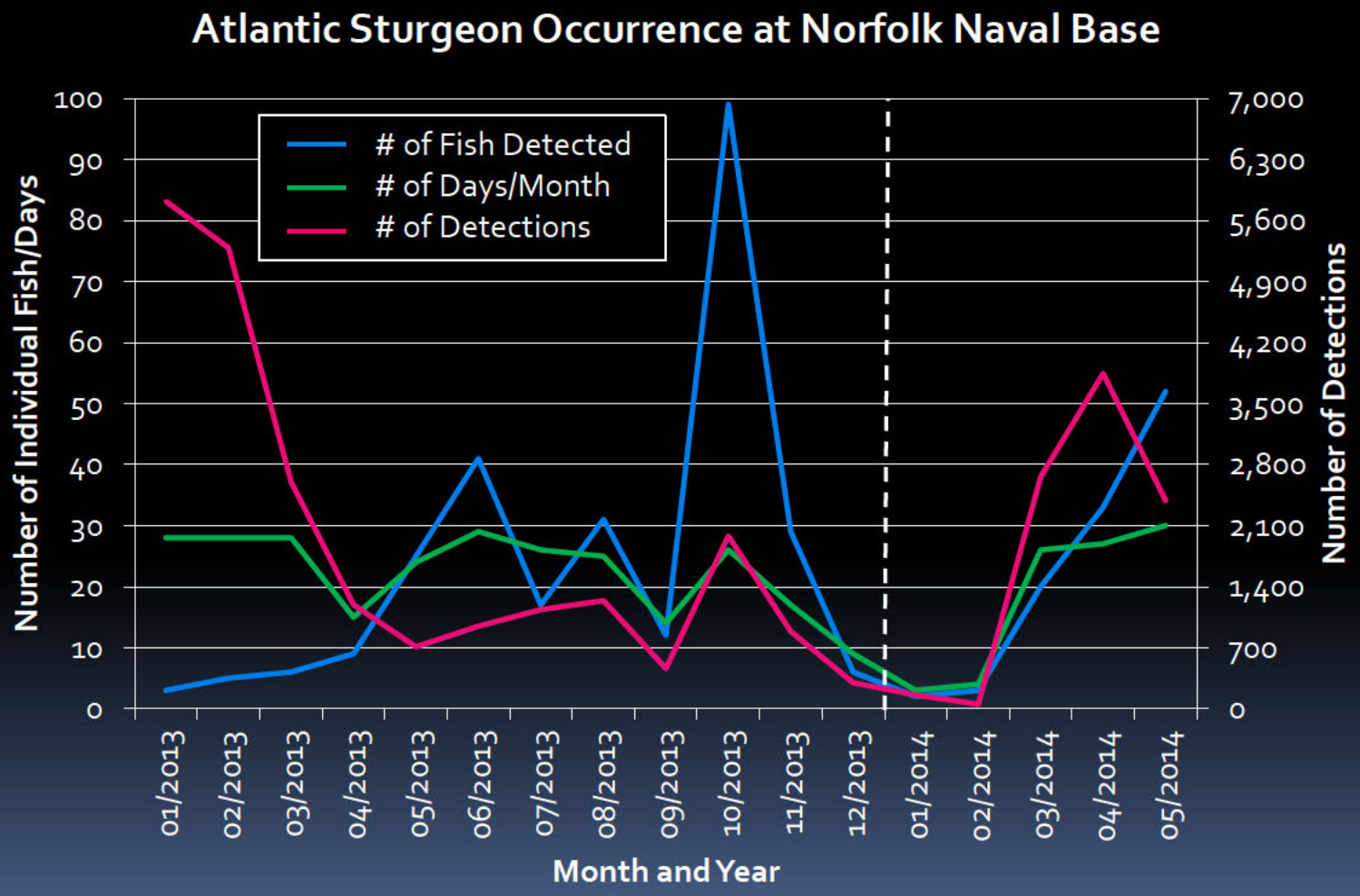
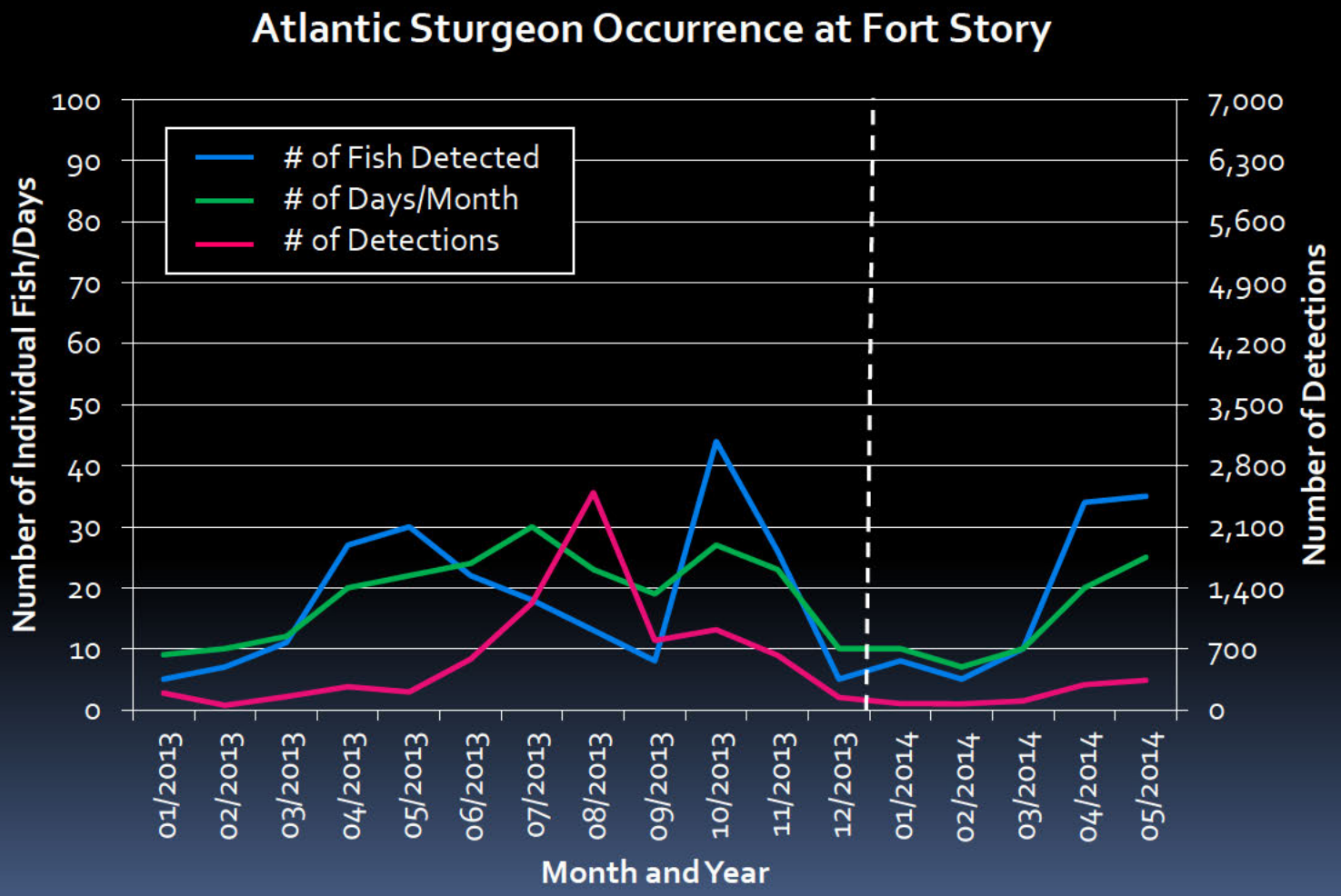
Navy Receiver Array in the Lower Chesapeake Bay



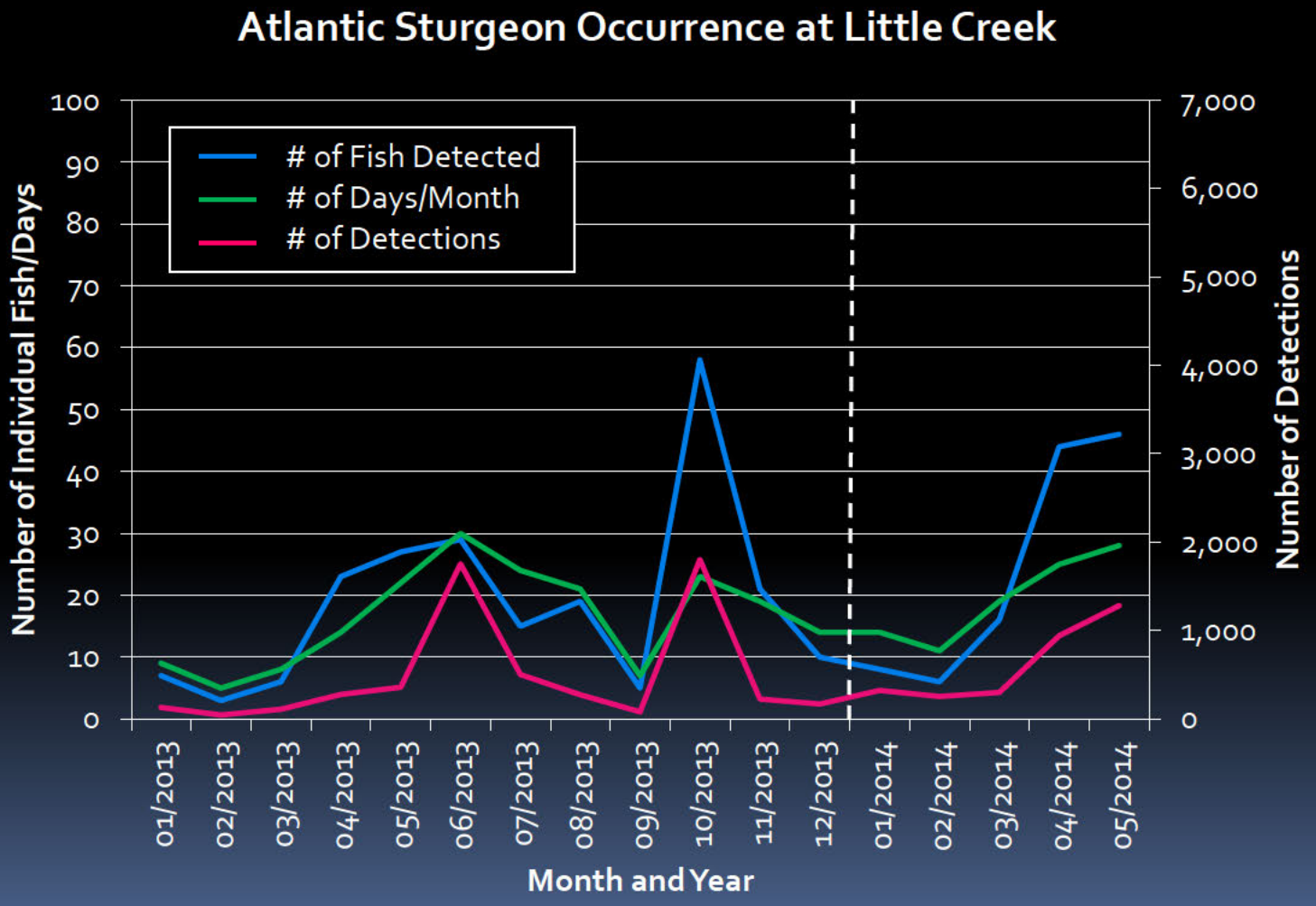
Navy Receiver Array in the Lower Chesapeake Bay



Navy Receiver Array in the Lower Chesapeake Bay



Navy Receiver Array in the Lower Chesapeake Bay



Navy Receiver Array in the Lower Chesapeake Bay

The data collected from the array will enable the Navy to determine:

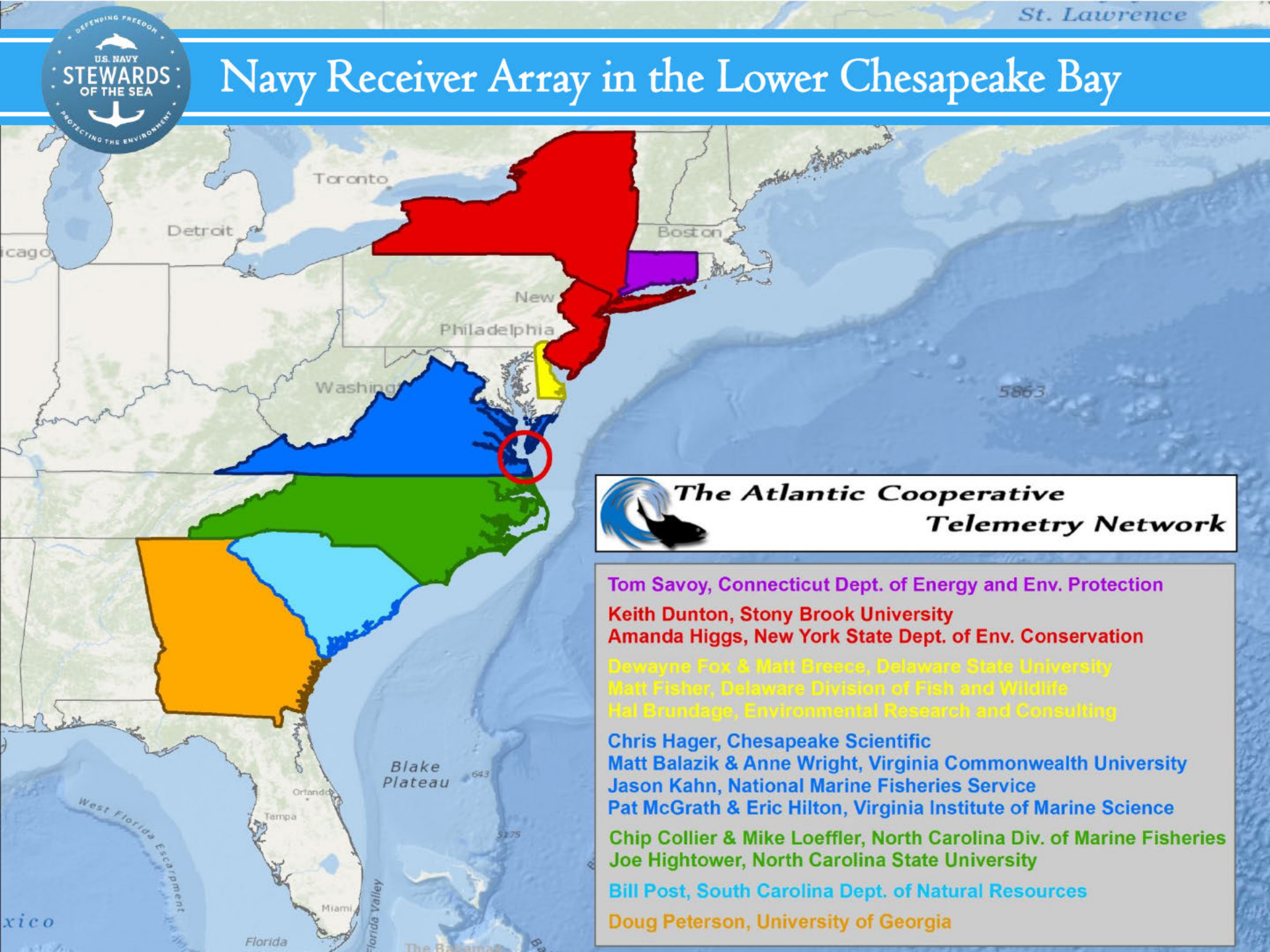
- When sturgeon are present within the Bay
- What areas of the Bay they are utilizing
- How long sturgeon are staying at any given location within the Bay
- Their seasonal movement patterns
- Areas and periods of overlap between the Navy's and the sturgeon's use of the Bay

Navy Receiver Array in the Lower Chesapeake Bay

Sturgeon Detections within the Chesapeake Bay

- The sturgeon being detected by the Navy's array were tagged by numerous researchers along the East Coast.
- Researchers are part of the Atlantic Cooperative Telemetry (ACT) Network - www.theactnetwork.com
- The sturgeon showing up in the Chesapeake Bay were tagged between Connecticut and Georgia.

Navy Receiver Array in the Lower Chesapeake Bay



The Atlantic Cooperative Telemetry Network

Tom Savoy, Connecticut Dept. of Energy and Env. Protection

Keith Dunton, Stony Brook University
Amanda Higgs, New York State Dept. of Env. Conservation

Dewayne Fox & Matt Breece, Delaware State University
Matt Fisher, Delaware Division of Fish and Wildlife
Hal Brundage, Environmental Research and Consulting

Chris Hager, Chesapeake Scientific
Matt Balazik & Anne Wright, Virginia Commonwealth University
Jason Kahn, National Marine Fisheries Service
Pat McGrath & Eric Hilton, Virginia Institute of Marine Science

Chip Collier & Mike Loeffler, North Carolina Div. of Marine Fisheries
Joe Hightower, North Carolina State University

Bill Post, South Carolina Dept. of Natural Resources

Doug Peterson, University of Georgia

Navy Receiver Array in the Lower Chesapeake Bay

From December 2012 through May 2014 the Navy's Chesapeake Bay receiver array had 199,474 detections of 910 individual fish:

Species	Navy Tagged	# of Fish Detected
Atlantic sturgeon	Partially (4%)	541
Black drum		3
Blueback herring	Yes	45
Striped bass		32
Bull shark		3
Sand tiger shark		127
Sandbar shark		19
Spiny dogfish		7
White shark		4
Green turtle	Yes	1
Kemp's ridley turtle	Yes	1
Loggerhead turtle	Partially (88%)	8

Navy Receiver Array in the Lower Chesapeake Bay

Cooperative Partnerships and Data Sharing

- Since the Navy is relying heavily on the work of other researchers, it is important to the Navy that those researchers are provided with information on the movements of the fish they tagged.
- The Navy is currently providing data on fish movements in the lower Chesapeake Bay to numerous agencies, organizations, and universities:
  - Five federal agencies
  - Nine state agencies
  - Eleven academic institutions
  - Two non-profit organizations

Navy Receiver Array Cooperative Partnerships

VIRGINIA
AQUARIUM

Smithsonian Environmental
Research Center

Information on the U. S. Navy's Environmental Initiatives

U. S. Navy Stewards of the Sea
https://www.facebook.com/USNavyStewardsoftheSea

U. S. Navy Marine Species Monitoring Program
http://www.navymarinespeciesmonitoring.us/

U.S. Navy Living Marine Resources Program
http://www.lmr.navy.mil/

Office of Naval Research Marine Mammals & Biology Program
http://www.onr.navy.mil/Science-Technology/Departments/Code-32.aspx

U. S. Navy Energy, Environment, and Climate Change
http://greenfleet.dodlive.mil/environment/